



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informáticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000358 - Participatory Decision Making And Negotiation

DEGREE PROGRAMME

10AJ - Master Universitario en Inteligencia Artificial

ACADEMIC YEAR & SEMESTER

2020/21 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	103000358 - Participatory Decision Making And Negotiation
No of credits	5 ECTS
Type	Optional
Academic year of the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AJ - Master Universitario en Inteligencia Artificial
Centre	10 - Escuela Tecnica Superior de Ingenieros Informaticos
Academic year	2020-21

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Jacinto Gonzalez Pachon (Subject coordinator)	2101	jacinto.gonzalez.pachon@upm.es	Sin horario.
Javier Bajo Perez	2101	javier.bajo@upm.es	Sin horario.

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Conocimientos de Algebra Lineal y de Cálculo Diferencial

4. Skills and learning outcomes *

4.1. Skills to be learned

CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CEIA10 - Identificación de áreas de aplicación en las que se pueda utilizar las técnicas y métodos de la Inteligencia Artificial.

CEIA3 - Conocimiento y aplicación de los modelos cuantitativos que dan soporte a los procesos de toma de decisiones en sus distintas variantes: determinístico-estocástico, individual-colectivo o estático-dinámico

CG13 - Apreciación de los límites del conocimiento actual y de la aplicación práctica de la tecnología más reciente.

CG16 - Capacidad de trabajar de forma independiente en su campo profesional.

CG17 - Habilidades de gestión y capacidad de liderar un equipo que puede estar integrado por disciplinas y niveles distintos.

CG19 - Aproximación sistemática a la gestión de riesgos.

CG11 - Adquirir conocimientos científicos avanzados del campo de la informática que le permitan generar nuevas ideas dentro de una línea de investigación.

CG12 - Comprender el procedimiento, valor y límites del método científico en el campo de la Informática, siendo capaz de identificar, localizar y obtener datos requeridos en un trabajo de investigación, de diseñar y guiar investigaciones analíticas, de modelado y experimentales, así como de evaluar datos de una manera crítica y extraer conclusiones.

CG13 - Capacidad para valorar la importancia de las fuentes documentales, manejarlas y buscar la información para el desarrollo de cualquier trabajo de investigación.

CG14 - Capacidad de leer y comprender publicaciones dentro de su ámbito de estudio/investigación, así como su catalogación y valor científico.

4.2. Learning outcomes

RA73 - Ser capaz de aplicar modelos de negociación y de toma de decisión colectiva, bajo el paradigma "satisfaciente", a la resolución de conflictos y la mediación.

RA72 - Ser capaz de expresar las ideas del estado del arte y las ideas nuevas aportadas, tanto de manera oral como escrita.

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

In this module, *satisficing* logic is presented as the rational framework for negotiation analysis and participative decision making. This framework will appear as the ideal one to strengthen the link between both of these disciplines of decision analysis. The way to implement satisficing logic, both to a preference aggregation problem and to a negotiation analysis problem, will be through the use of Goal Programming.

5.2. Syllabus

1. Structuring a problem of negotiation and collective decision-making
 - 1.1. Glossary of terms
 - 1.2. Formal framework for Collective Decision Theory
 - 1.3. Formal framework for Negotiation Analysis
2. Satisficing logic and Goal Programming
 - 2.1. Satisficing paradigm vs. Optimizing paradigm
 - 2.2. Satisficing logic and Goal Programming (GP): basic connections
 - 2.3. Basic forms and extensions of the achievement function
3. Participative decision-making problems with información ordinal
 - 3.1. Agreggation of complete rankings under satisficing logic
 - 3.2. Agreggation of partial rankins under satisficing logic
 - 3.3. An unified model
4. Participative decision-making problems with cardinal information
 - 4.1. Agreggation of utility functions under satisficing logic
 - 4.2. Agreggation of pairwise comparison matrices under satisficing logic
 - 4.3. An unified model
5. Bargaining and Arbitration
 - 5.1. Axiomatic Bargaining
 - 5.2. Problems with axiomatic system

5.3. Arbitration

6. An application: Social Computing

6.1. Virtual organizations

6.2. Agreement technologies

7. An application: Solving inconsistencies in decision analysis

7.1. Intransitivities

7.2. Incoherences

7.3. Open problems

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1			Course presentation Duration: 02:00 Lecture	
2			Lesson 1 Duration: 02:00 Lecture	
3			Lesson 2 Duration: 02:00 Lecture	
4			Presentations day: lessons 1 and 2 Duration: 02:00 Additional activities	Assessment: lessons 1 and 2 Online test Continuous assessment Presential Duration: 02:00
5			Lesson 3 Duration: 02:00 Lecture	
6			Lesson 4 Duration: 02:00 Lecture	
7			Presentation days: lessons 3 and 4 Duration: 02:00 Additional activities	Assessment: lessons 3 and 4 Online test Continuous assessment Presential Duration: 02:00
8			Workshop 1 Duration: 02:00 Additional activities Group Tutorial Duration: 02:00 Cooperative activities	
9			Lesson 5 Duration: 02:00 Lecture	
10			Group Tutorial Duration: 02:00 Cooperative activities Workshop 2 Duration: 02:00 Lecture	

11			Lesson 6 (part 1) Duration: 02:00 Lecture	
12			Lesson 6 (Part 2) Duration: 02:00 Lecture	
13			Lesson 7 Duration: 02:00 Lecture Group tutorial Duration: 02:00 Cooperative activities	
14			Presentations day: Lessons 5 and 6 Duration: 02:00 Additional activities Group tutorial Duration: 02:00 Cooperative activities	Assessment: lessons 5 and 6 Online test Continuous assessment Presential Duration: 02:00
15			Group tutorial Duration: 02:00 Cooperative activities Presentation day: scientific paper (I) Duration: 02:00 Additional activities	Assessment:: Scientific paper presentation Online test Continuous assessment Presential Duration: 02:00
16				Assessment: Group scientific article Group work Continuous assessment Not Presential Duration: 00:00
17				Final exam Online test Final examination Presential Duration: 02:00 Scientific presentation Online test Final examination Not Presential Duration: 00:00 Scientific article Individual work Final examination Not Presential Duration: 00:00

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Assessment: lessons 1 and 2	Online test	Face-to-face	02:00	20%	5 / 10	CG16 CG17 CGI3 CGI4 CEIA10 CEIA3
7	Assessment: lessons 3 and 4	Online test	Face-to-face	02:00	20%	5 / 10	CG16 CG17 CGI3 CGI4 CEIA10 CEIA3
14	Assessment: lessons 5 and 6	Online test	Face-to-face	02:00	20%	5 / 10	CGI3 CGI4 CG16 CG17 CEIA10 CEIA3
15	Assessment: Scientific paper presentation	Online test	Face-to-face	02:00	20%	5 / 10	CG16 CG17 CGI1 CGI3 CGI4 CEIA10 CG13 CG19 CGI2 CEIA3
16	Assessment: Group scientific article	Group work	No Presential	00:00	20%	5 / 10	CG16 CG17 CGI1 CGI3 CGI4 CEIA10 CG13 CG19 CGI2 CEIA3

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Final exam	Online test	Face-to-face	02:00	50%	5 / 10	CG16 CG17 CGI3 CGI4 CEIA10 CEIA3
17	Scientific presentation	Online test	No Presential	00:00	25%	5 / 10	CG16 CG17 CGI1 CGI3 CGI4 CEIA10 CG13 CG19 CGI2 CEIA3
17	Scientific article	Individual work	No Presential	00:00	25%	5 / 10	CG16 CG17 CGI1 CGI3 CGI4 CEIA10 CG13 CG19 CGI2 CEIA3

7.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

7.2. Assessment criteria

CONTINUOUS EVALUATION

Regular attendance to class is mandatory to apply the continuous evaluation.

Lecture notes of theoretical content will be evaluated according to their completeness, clarity, coherence and originality, as well as the ability to interconnect ideas.

The collective works will be evaluated according to the participation index, the ability to interconnect ideas, clarity and originality.

The individual presentation will be evaluated according to its clarity and coherence.

The scientific work in group will be evaluated according to its clarity, coherence and originality.

EXTRAORDINARY EVALUATION

The score in extraordinary examination will be obtained by the same concepts detailed in the table of Summative Evaluation. However, the individual presentation will consist of a document that includes the content of the presentation; whereas the scientific paper will be an individual work.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
French, S. (1989) Decision Theory. Ellis Horwood, Cichester	Bibliography	Libro
Hwang, C-H.; Lin, M-J. (1987). Group decision making under multiple criteria. Springer-Verlag, Berlín	Bibliography	Libro

Raiffa, H.; Richardson, J.; Metcalfe, D. (2002). Negotiation Analysis. Belknap Harvard, Cambridge, MA.	Bibliography	Libro
Romero, C. (1991). Handbook of Critical Issues in Goal Programming. Pergamon Press	Bibliography	Libro
González-Pachón J.; Romero, C. (1999) "Distance-based consensus methods: a goal programming approach", OMEGA 27: 341-347	Bibliography	Artículo
González-Pachón J.; C. Romero (2001) "Aggregation of partial ordinal rankings: an interval goal programming approach", Computers & Operation Research, 28: 827-834	Bibliography	Artículo
González-Pachón J.; Romero, C. (2004) "Satisficing logic and goal programming: Towards an axiomatic link", INFOR 42: 157-161	Bibliography	Artículo
González-Pachón J; Romero C (2004) "A method for dealing with inconsistencies in pairwise comparisons", European Journal of Operational Research 158: 351-361.	Bibliography	Artículo
González-Pachón, J; Romero, C (2006) "An analytical framework for aggregating multiattribute utility functions", Journal of the Operational Research Society 57: 1241-1247.	Bibliography	Artículo
González-Pachón, J; Romero, C. (2007) "Inferring consensus weights from pairwise comparison matrices without suitable properties", Annals of Operations Research 154: 123-132	Bibliography	Artículo

González-Pachón J; Romero C (2008) "A method for obtaining transitive approximations of a binary relation", Annals of Operations Research 163: 197-208	Bibliography	Artículo
Kersten,G. E. (2001) "Modelling distributive and integrative negotiations: review and revised characterization", Group Decision and Negotiation 10: 493-514.	Bibliography	Artículo
Nakayama, H., et al. (1979) "Methodology for group decision support with application to assessment of residential environment", IEEE Transactions on Systems, Man, and Cybernetics, Vol.SMC-9. N°9: 447-485.	Bibliography	Artículo
Sebenius, J. K. (1992) "Negotiation Analysis: A Characterization and Review" Management Science 38:18-38.	Bibliography	Artículo
Ferber, O. Gutknecht, F. Michel. (2004) "From Agents to Organizations: an Organizational View of Multi-Agent Systems", LNCS 2935: 214?230.	Bibliography	Artículo
Ossowski S. (2013). "Agreement Technologies", Law, Governance and Technology Series vol. 8.	Bibliography	Libro
Virtual classroom	Web resource	
Twitter: @jgpachon07_neg	Web resource	